

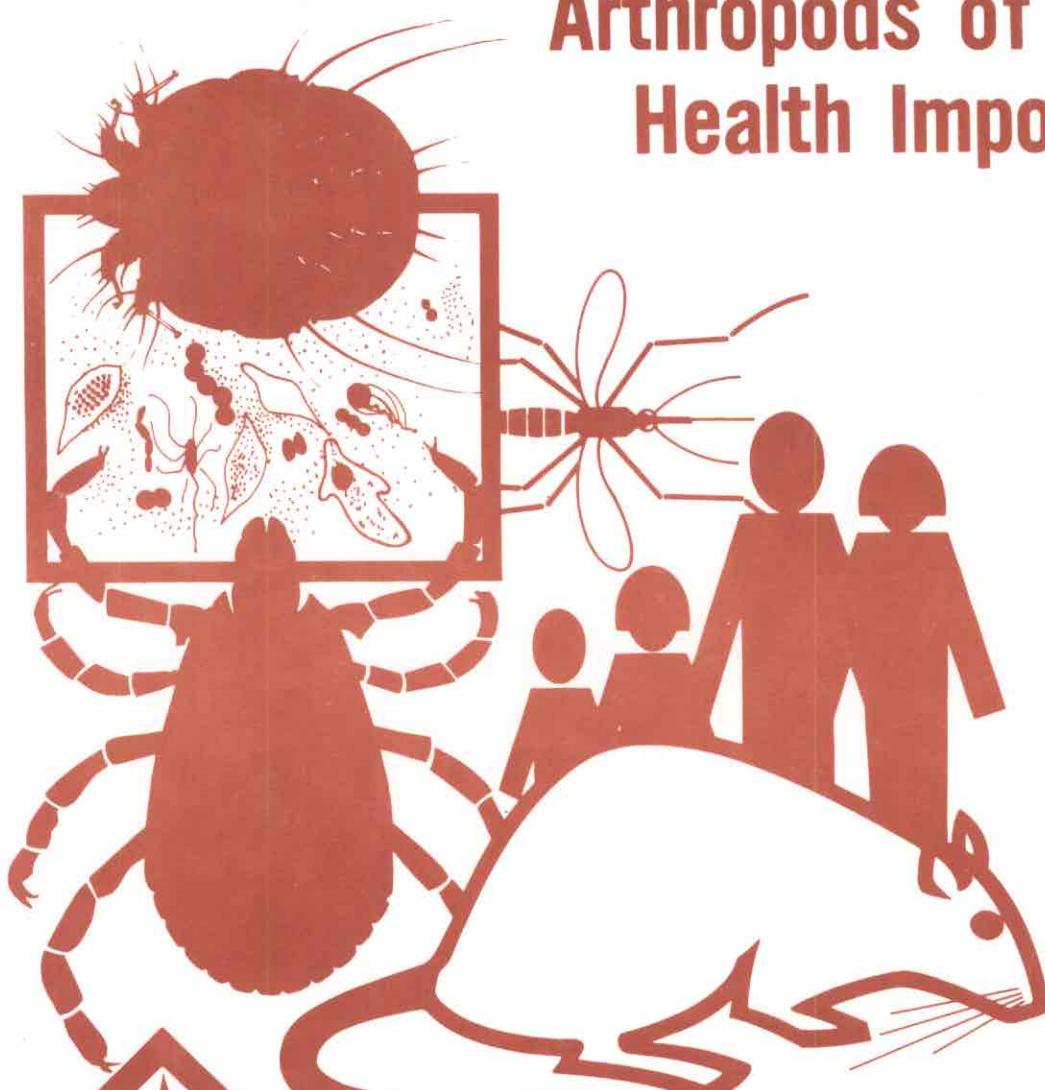


LESSON
1

SELF-STUDY COURSE 3013-G

Vector-Borne Disease Control

Arthropods of Public Health Importance



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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

SELF-STUDY

PUBLIC HEALTH SERVICE
Centers for Disease Control
Public Health Practice Program Office
Atlanta, Georgia 30333

VECTOR-BORNE DISEASE CONTROL

Self-Study Course 3013-G

LESSON 1: INTRODUCTION TO ARTHROPODS OF PUBLIC HEALTH IMPORTANCE

I: LESSON CONSISTS OF:

Part I: 25 multiple choice questions
Part II: 25 multiple choice questions

II: REFERENCE:

Introduction to Arthropods of Public Health Importance.

III: TOPICS AND READING ASSIGNMENTS:

Introduction
to Arthropods

A. Ch. 1 - Arthropods and Public Health	4-13
B. Ch. 2 - Classification of Insects and Other Arthropods	14-17
C. Ch. 3 - The Classes of Arthropods	18-27
D. Ch. 4 - The External Structure of Insect	28-33
E. Ch. 5 - The Internal Structure and Physiology of Insects	34-40
F. Ch. 6 - The Development of Insects	41-43
G. Ch. 7 - The Senses of Insects	44-45
H. Ch. 8 - Insect Behavior	46
I. Ch. 9 - Insect Identification	47

VECTOR-BORNE DISEASE CONTROL

Lesson 1 - Objectives

Upon successful completion of Lesson 1, the student should be able to correctly:

- Identify selected arthropods of public health importance, their anatomical and physiological composition, and their biological classification.
- Identify the following:
 - biological transmission
 - entomophobia
 - mechanical transmission
 - metamorphosis
 - oviparous.

VECTOR-BORNE DISEASE CONTROL

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Lesson 1

INTRODUCTION TO ARTHROPODS OF PUBLIC HEALTH IMPORTANCE

Part I: Multiple-Choice

1. How are humans affected directly by arthropods?
 - A. Infestation
 - B. Bites
 - C. Anaphylactic shock
 - D. All of the above.
2. The term "entomophobia" means:
 - A. A fear of insects.
 - B. The science of insect classification.
 - C. The study of insects.
 - D. The study of insect behavior.
3. Which of the insects listed below could cause myiasis?
 - A. Dragon fly
 - B. Flea
 - C. Screwworm fly
 - D. Mite
4. Humans are incidental hosts in which of the following diseases?
 - A. Malaria
 - B. Dengue
 - C. Plague
 - D. Epidemic typhus
5. The bite of the brown recluse spider may result in:
 - A. Tissue necrosis.
 - B. Death.
 - C. Urtication.
 - D. All of the above.

Lesson 1/Part I

6. Cantharidin, which is found in the blood of some beetles, causes:
 - A. Painful blistering when it contacts the skin.
 - B. Blood to clot rapidly.
 - C. Necrosis at the site of bite.
 - D. Diarrhea and chills.
7. An arthropod which carries infection to humans or other hosts is defined as a(n):
 - A. Insect.
 - B. Vector.
 - C. Parasite.
 - D. Vehicle.
8. The arthropodborne diseases most frequently associated with a mechanical means of transmission are:
 - A. Encephalitides.
 - B. Typhus fevers.
 - C. Dermatitis reactions.
 - D. Enteric infections.
9. Which of the following diseases IS NOT likely transmitted by the house fly *Musca domestica*?
 - A. Malaria.
 - B. Cholera.
 - C. Amebic dysentery.
 - D. Typhoid fever.
10. A feature of biological transmission which distinguishes it from mechanical transmission is:
 - A. The parasite is transmitted by a biting insect.
 - B. The diseases transmitted biologically are usually fatal.
 - C. The vector is important in the life cycle of the parasite.
 - D. The vector and the reservoir are the same.
11. In insects, the body part which acts as a protective structure and which provides for the attachment of muscles is known as the:
 - A. Sternites
 - B. Endoskeleton
 - C. Sclerites
 - D. Exoskeleton

12. Which mouth part IS NOT found in primitive (chewing) insects?
- A. Labrum
 - B. Hypopharynx
 - C. Mandibles
 - D. Maxilla
13. Insects which possess sponging mouth parts and do not bite are:
- A. House flies.
 - B. Fleas.
 - C. Mosquitoes.
 - D. Deer flies.
14. How many antennae are characteristically possessed by insects?
- A. One pair
 - B. Two pairs
 - C. Three pairs
 - D. Four pairs
15. The thorax section of the insect serves which of the following purpose(s)?
- A. Attachment of the legs
 - B. Attachment of the wings
 - C. Attachment of the ocelli
 - D. A and B above
16. Which term refers to the rudimentary wings or balancers found on the fly?
- A. Hypopharynx
 - B. Pronotum
 - C. Haltere
 - D. Sternum
17. The pulvilli, found on tarsal segments of insect legs, are used to assist the insect in:
- A. Walking on smooth surfaces.
 - B. Grasping limbs.
 - C. Jumping quickly when excited.
 - D. Running from a standing start.

18. The spiracles of the respiratory system are located on the:
- A. Head.
 - B. Trochanter.
 - C. Abdomen.
 - D. Ovipositor.
19. Which of the following IS NOT part of the insect's digestive system?
- A. Esophagus
 - B. Spiracle
 - C. Proventriculus
 - D. Crop
20. Plague bacilli multiply rapidly in the digestive system of the flea and block off the system beginning at the:
- A. Crop.
 - B. Stomach.
 - C. Mouth.
 - D. Proventriculus.
21. An insect's food which is not completely digested is discharged as:
- A. Feces.
 - B. True body waste.
 - C. Coprolites.
 - D. Malpighian bodies.
22. The blood of insects:
- A. Removes waste products from body cells and carries them to Malpighian tubules.
 - B. Serves as part of the respiratory system.
 - C. Contains no phagocytes.
 - D. Bears oxygen and carries off carbon dioxide.
23. Blood circulation in the insect differs from that of humans in that:
- A. The insect has no heart.
 - B. The blood is not enclosed in vessels.
 - C. The insect has no blood vessels.
 - D. The blood is not pumped or circulated.

Lesson 1/Part I

24. Respiration varies considerably among insect species. Culicine mosquito larvae, for example, breathe through:
- A. Tracheae.
 - B. Spiracular plates.
 - C. Thoracic ganglia.
 - D. Air tubes.
25. Insects which lay eggs are termed:
- A. Parthogenetic.
 - B. Larviparous.
 - C. Hermaphroditic.
 - D. Oviparous.

Part II: Multiple-Choice

1. A key role in the transmission of arthropodborne diseases is played by which of the following systems?
 - A. Circulatory
 - B. Digestive
 - C. Excretory
 - D. Respiratory
2. In which part of the reproductive system does a female insect store male sperm cells?
 - A. Seminal vesicle
 - B. Accessory gland
 - C. Spermatheca
 - D. Trochanter
3. Metamorphosis of an insect is defined as:
 - A. Changes in form or structure occurring during its development.
 - B. The sexual cycle in its life history.
 - C. Wing structures among various insects.
 - D. The entire life span of the species.
4. Which developmental stage is found ONLY in insects which undergo gradual metamorphosis?
 - A. Egg
 - B. Larva
 - C. Nymph
 - D. Pupa
5. Which insect order has gradual metamorphosis?
 - A. Diptera
 - B. Siphonaptera
 - C. Hymenoptera
 - D. Hemiptera
6. Which of the following describes the life history of an insect with complete metamorphosis?
 - A. Egg, larva, pupa, adult
 - B. Egg, pupa, nymph, adult
 - C. Egg, nymph, adult
 - D. Egg, larva, nymph, adult

7. Which insect has complete metamorphosis?
 - A. Flea
 - B. Kissing bug
 - C. German cockroach
 - D. Crab louse
8. A molting insect sheds which of the following structures?
 - A. Exoskeleton
 - B. Foregut lining
 - C. Respiratory system linings
 - D. All of the above
9. The sense of smell in insects is located:
 - A. Only in the antennae.
 - B. In the antennae, palps, and sense hairs.
 - C. Only in the palps.
 - D. In the antennae, and the palps.
10. What percent of the house fly's body weight is devoted to flight musculature?
 - A. 1.0%
 - B. 2.5%
 - C. 5.0%
 - D. 10.0%
11. Which term is used to classify the family of the mosquito?
 - A. Arthropoda
 - B. Insects
 - C. Culicidae
 - D. Anopheline
12. Insects (and other living things) were first classified by Linnaeus using:
 - A. Darwin's Origin of the Species as a basis.
 - B. Latin and binomial nomenclature.
 - C. Arabic and scientific data.
 - D. German and French scientific inflection.

Lesson 1/Part II

13. The most important arthropods are found in the class:

- A. Chilopoda.
- B. Arachnida.
- C. Insecta.
- D. Diplopoda.

14. Which arthropod class contains spiders, ticks, and mites?

- A. Insecta
- B. Arachnida
- C. Acarina
- D. Chilopoda

15. Crustaceans are of public health importance because:

- A. They serve as intermediate hosts in some helminthic diseases.
- B. They inflict a painful bite which causes necrosis.
- C. Of their ability to infest the intestinal tract of humans.
- D. They mechanically transmit most of the filth-borne diseases.

16. Which of the following arachnids belongs to the order Acarina?

- A. Black widow spider
- B. Scorpion
- C. House mouse mite
- D. Brown recluse spider

17. Insects are divided into orders based on characteristics, such as:

- A. Mouth parts, wings, and metamorphosis.
- B. Feeding habits, locomotion, and antennae.
- C. Number of legs, antennae, and body sections.
- D. Metamorphosis, number of legs, and body sections.

18. Which insect order is of LEAST importance to public health?

- A. Diptera
- B. Coleoptera
- C. Siphonaptera
- D. Anoplura

Lesson 1/Part II

19. Silverfish and firebrats are included in this study of arthropods of public health importance because:
- A. Of a painful bite they inflict.
 - B. Of their contribution to epidemics of human disease.
 - C. They often invade the human host and infest the nasal and alimentary tracts.
 - D. They are found in homes and inquiries concerning them are frequently made to the public health worker.
20. Which member of the order Orthoptera is thought to transmit diseases?
- A. Mantid
 - B. Cricket
 - C. Cockroach
 - D. Grasshopper
21. Biting lice belong to the order:
- A. Anoplura.
 - B. Isoptera.
 - C. Dermaptera.
 - D. Mallophaga.
22. Sucking lice are well known in history for their transmission of:
- A. Typhus.
 - B. Plague.
 - C. Rabies.
 - D. Botulism.
23. African sleeping sickness and malaria are transmitted by members of the order:
- A. Siphonaptera.
 - B. Hymenoptera.
 - C. Lepidoptera.
 - D. Diptera.
24. The insect order of greatest significance to public health is:
- A. Anoplura.
 - B. Hymenoptera.
 - C. Hemiptera.
 - D. Diptera.

25. Which order includes wingless insect vectors with complete metamorphosis?
- A. Siphonaptera.
 - B. Dermaptera.
 - C. Anoplura.
 - D. Thysanura.

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LESSON
1

SELF-STUDY COURSE 3013-G
vector-Borne Disease Control

ANSWER SHEET

PART I				PART II					
NO.	A	B	C	D	NO.	A	B	C	D
1	0	0	0	0	1	0	0	0	0
2	0	0	0	0	2	0	0	0	0
3	0	0	0	0	3	0	0	0	0
4	0	0	0	0	4	0	0	0	0
5	0	0	0	0	5	0	0	0	0
6	0	0	0	0	6	0	0	0	0
7	0	0	0	0	7	0	0	0	0
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24	0	0	0	0	24	0	0	0	0
25	0	0	0	0	25	0	0	0	0

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